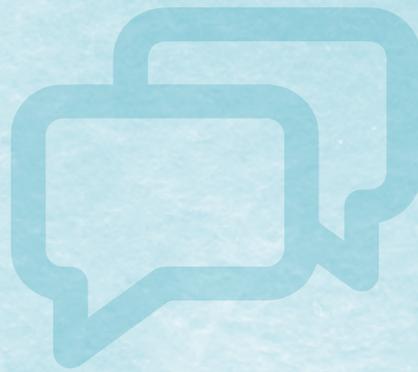




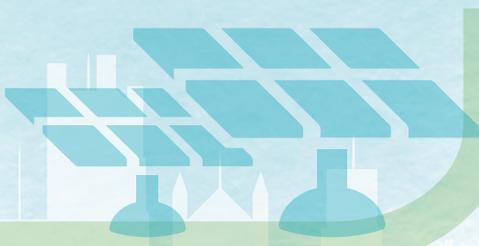
THE CAMBRIDGE *green*  
CHALLENGE



UNIVERSITY OF CAMBRIDGE

# Carbon Reduction Strategy

2020 Update



# Introduction

Climate change presents challenges that will be with us for generations to come. While individuals can and must act to reduce carbon emissions, it is societal and institutional action, sustained through the decades, which must lie at the heart of meeting these challenges. The University is in a strong position to provide such sustained leadership based on actions that are well documented and rigorously evaluated. Our consultations of staff and students indicate that there is considerable appetite to provide this leadership and to exploit the expertise and research activities of the University.

When this Strategy was adopted in 2018, we made a commitment to adopt a Science Based Target for carbon reduction. We have now done this, and our new target is presented in this updated version of the Strategy.

Society as a whole faces the challenge of making absolute reductions in emissions while simultaneously seeking to improve quality of life, often through economic growth. The University faces a similar challenge – the likelihood is of continued growth, particularly in respect of our research activities.

We have had some success in recent years in reducing our relative emissions, for example, emissions per member of staff (Figure 1). These relative improvements are the result of our interventions and the reduction in the carbon intensity of the UK electricity grid.

Under the Carbon Management Plan that was adopted in 2010, the University has in the past set ambitious absolute carbon reductions targets. Due to growth, we have actually increased our carbon emissions above our 2005/06 target baseline (Figure 2). The University will very likely continue to grow, but we must nonetheless reduce our absolute emissions. Therefore we need to reshape our institutional initiatives and policies in order accelerate our reduction programme.

Supplemented with a series of implementation plans, this Strategy replaces the University's Carbon Management Plan 2010–2020 and sets out a series of revised carbon reduction targets.

The Strategy is concerned with the reduction of the University's carbon footprint, which is related to but distinct from, the education and research activities of the University that pertain to climate change or greenhouse gas emission reduction. The Strategy is presented as a set of policies and approaches that we will take to reduce our emissions.



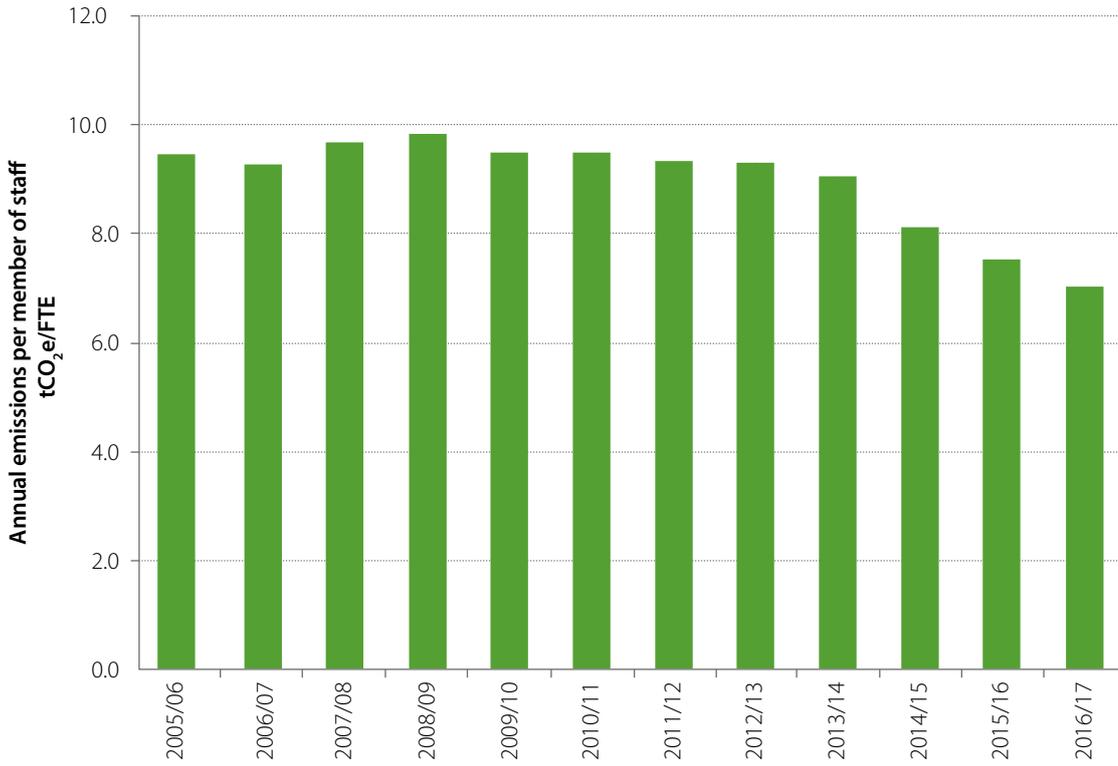
These approaches are expected to remain rational, even if our targets change over time.

There will be difficult choices to make in the future, potentially leading us to forgo some opportunities. The Strategy does not seek to make those choices, rather it provides a framework and approach to minimise the number and magnitude of those difficult decisions, recognising that even over the next ten years the landscape will change markedly.

This Strategy will interact with our Transport Strategy, and strategy for spatial planning; all three strategies will have to be further developed in concert.

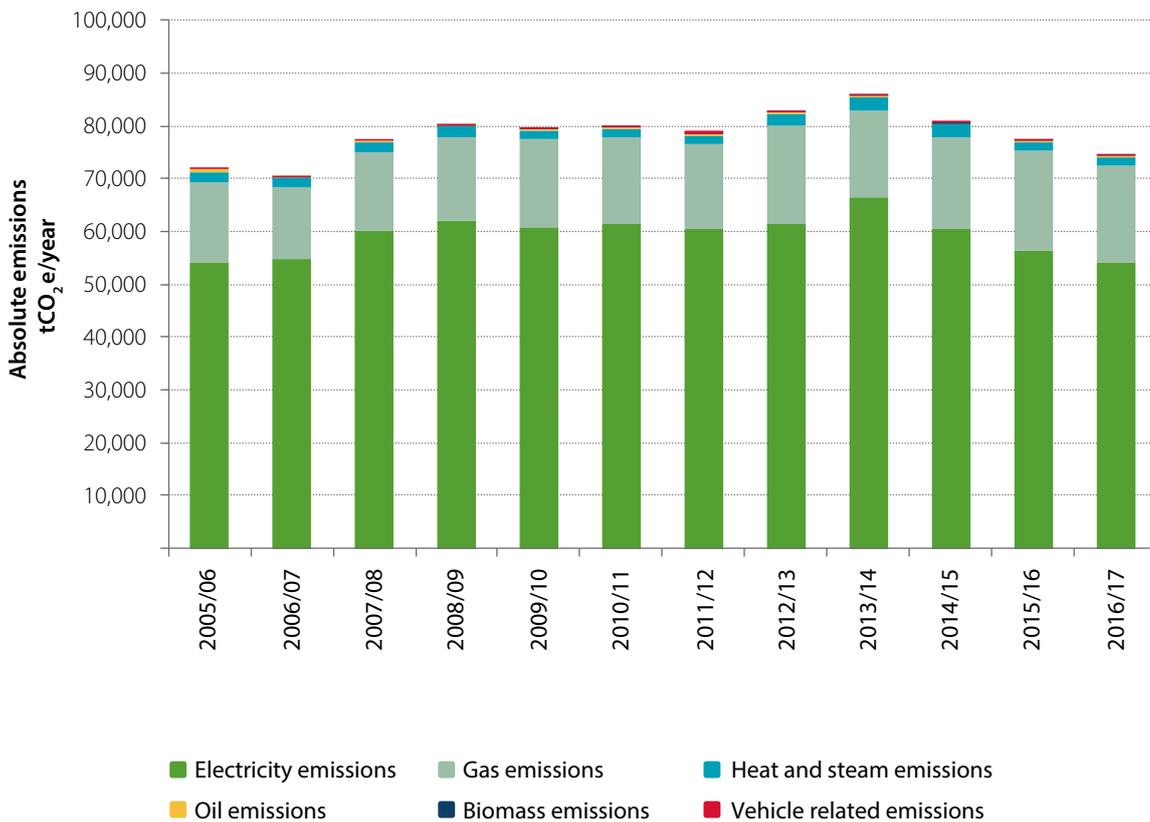
**F1**

**Figure 1: Scope 1 and 2 carbon emissions per staff FTE**



**F2**

**Figure 2: Our absolute scope 1 and 2 carbon emissions**



# Aspirations and targets



Greenhouse gas emissions are conventionally classified into one of three “scopes”:

➔ **Scope 1.** Direct emissions, primarily from carbon-based fuel combustion, including operational vehicles, but also fugitive emissions due to refrigerant leaks;

➔ **Scope 2.** Emissions which arise from purchased electricity, heat, steam, etc. – but whose production is from carbon-based fuel;

➔ **Scope 3.** All other emissions, notably those that arise from:

- Purchased goods and services, including the materials and processes used in constructing new buildings.
- Business travel.
- Employee commuting.
- Waste disposal.
- Investments.

Our scope 3 emissions are someone else’s scope 1 and 2 emissions.

While we have good understanding of our scope 1 and 2 emissions, we are not in a strong position with respect to scope 3. This is not uncommon; the usual approach of organisations has so far been to start by addressing scopes 1 and 2. But this is changing.

We need to take care that, as we get a better understanding of our scope 3 emissions, we compare like-for-like when understanding our progress on reduction.

Our long-term aspiration is to have zero carbon emissions for scopes 1 and 2 and minimal carbon for scope 3, which will be offset to obtain carbon neutrality.

## Our scope 1 and 2 target

In 2019, the University adopted a Science Based Target (SBT) for its scope 1 and 2 carbon emissions.

Put simply, a carbon reduction target is defined as science-based if it is in line with the scale of reductions required to keep global temperature increase below 2°C above pre-industrial temperatures (Science Based Target Initiative, 2018). Under the 2015 Paris Agreement, 2°C is the upper limit of the level of global warming that can occur before we trigger dangerous and irreversible climate change.

Science based targets are specific to an organisation; they effectively provide a carbon budget, within which the organisation must remain if it is to do its fair share in efforts to achieve the goals of the Paris Agreement.

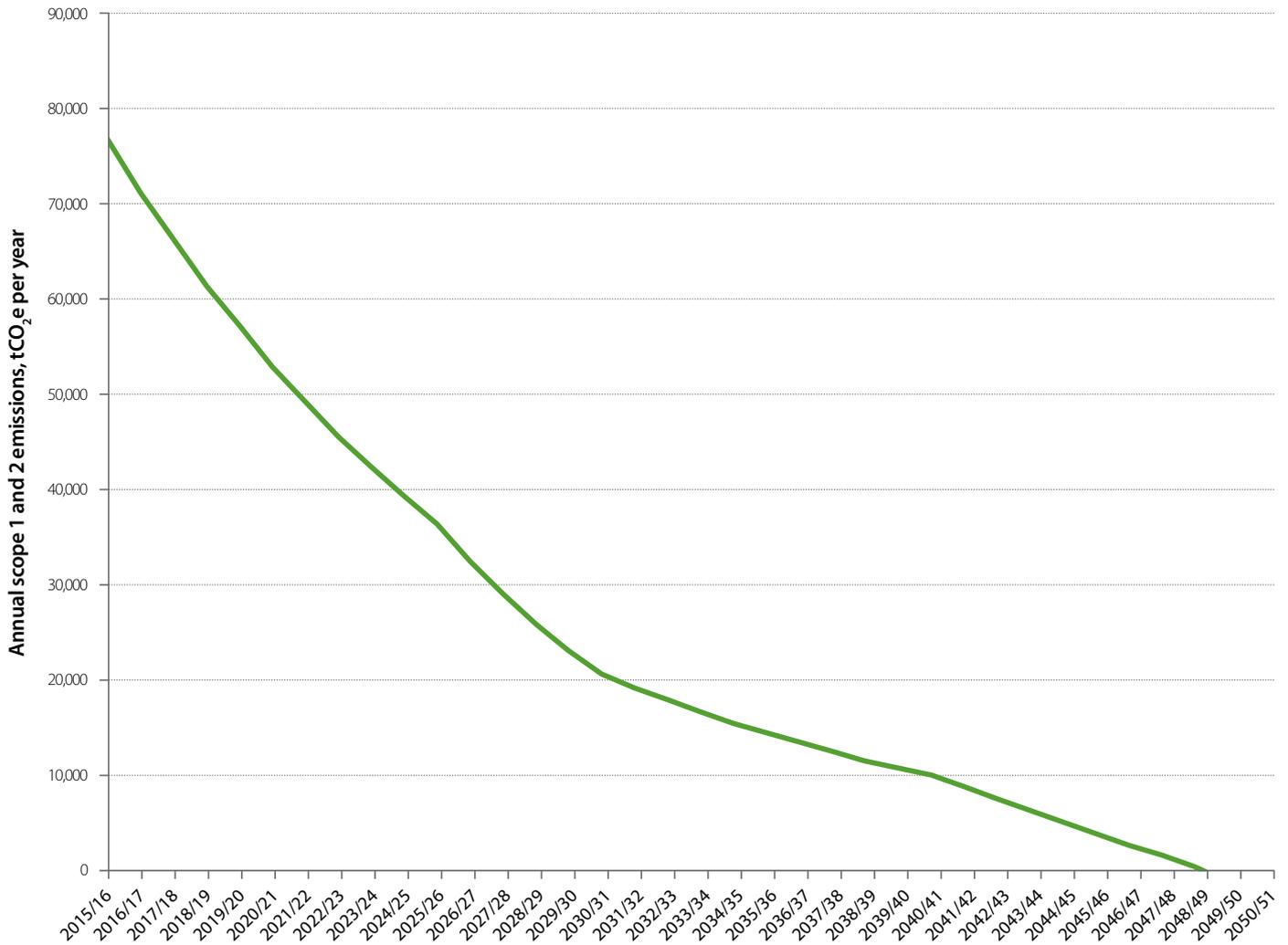
The University’s target is shown in the diagram below. The target has been set on a 1.5°C temperature increase limit. It commits us to reducing scope 1 and 2 emissions from the University’s operational estate to absolute zero by 2048.

We aspire to achieve zero carbon at least ten years ahead of the target date, so that our learning, successes and challenges can be shared with others seeking to become zero carbon.

At present, there is no mechanism for SBTs adopted by education institutions to be validated. However, our target has been developed by an external consultant who has direct, relevant experience and is a member of the Science Based Target Initiative’s Technical Advisory Group.

We will periodically review our target to ensure it reflects the latest climate science and data underlining the development of SBTs. We will also undertake work during 2020 to develop SBTs for the wider University estate, including Cambridge Assessment and Cambridge University Press.

## University of Cambridge science based target for carbon reduction



### Our scope 3 target

We will reduce per capita emissions from air business travel by 25% against 2014/15 levels by 2024/25, taking into consideration our current under-reporting.

We are carrying out work to inform the development of SBTs for our scope 3 emissions and will begin to publish the outcomes from this work in 2020.

### Zero carbon versus carbon neutrality

There is a subtle but important distinction between zero carbon and carbon neutrality.

Zero carbon is when no carbon is emitted in the first place. For example, we would achieve this in relation to our scope 2 emissions if we sourced all of our electricity, heat and steam from our own on-site renewable supplies.

Carbon neutrality - or net zero carbon emissions - is achieved when measured carbon emissions are balanced or equalised by an equivalent amount of carbon that is sequestered (captured and stored) or offset. For example, we would achieve this in relation to our scope 2 emissions if we generated some of our electricity from our own renewable sources and we fed this into the grid to balance the amount of energy that we consume from the grid.

# Actions and approach



University actions to reduce carbon emissions can be grouped into three broad categories.

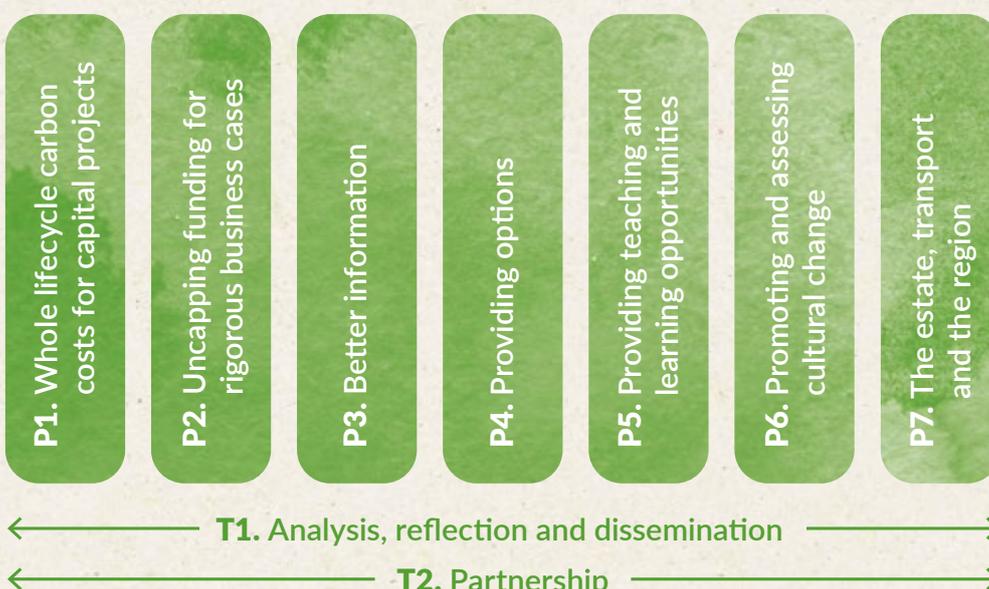
- 1 Institutional actions that generate financial return, or at worst, are financially neutral, for example, by reducing the amount of energy we purchase (*financial and environmental benefit*).
- 2 Institutional actions where financial return is negative (*environmental benefit*).
- 3 Institutional actions to improve information and options for individuals making decisions (*empowerment*).



THE CAMBRIDGE *green*  
**CHALLENGE**

Our approach to carbon reduction is presented below as seven pillars and two cross-cutting themes (Figure 3). These focus on the first and third of the categories set out above, but we will not lose sight of actions which do not generate a financial return.

**F3** Figure 3: The seven pillars and two cross-cutting themes of our approach



In order to achieve our goals, there must be a shift in culture across the University to a greater awareness and acceptance of responsibility for carbon emissions. Some of the pillars address this culture shift directly, but this shift will only be obtained if there are strong and visible institutional aspirations, actions, and incentives (which are the subject of the first four pillars).

The following section explains the seven pillars and two cross-cutting themes of our approach. Each pillar is a development of current activities; however, they are material departures from their predecessors.

## Pillar One:

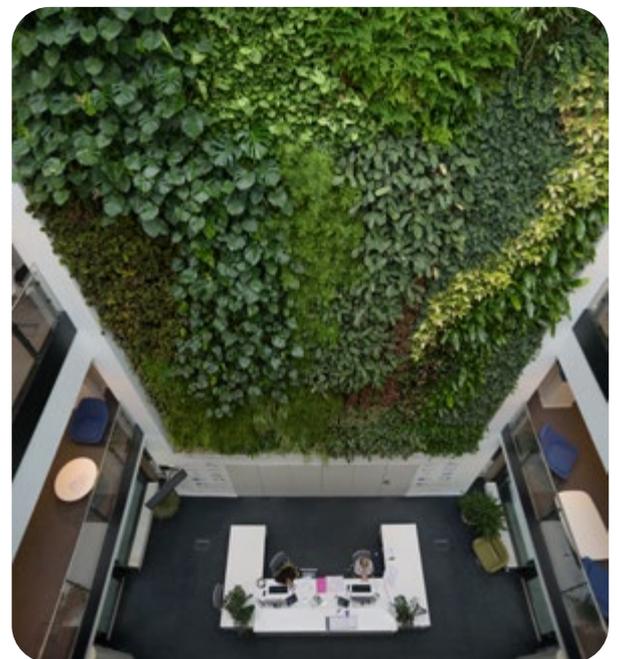
### Whole lifecycle carbon costs

The need to reduce emissions in absolute terms while continuing to grow requires a commitment to processes which ensure that additions to the estate are subject to more rigorous evaluation with respect to whole lifecycle carbon costs. Furthermore, resource allocation procedures within the University need to align long-term incentives so that no individual or institution is exposed to a perverse conflict between capital and operational costs.

The way in which the University operates its capital projects gives rise to an unhelpful separation of capital and operational expenditure. Projects are tasked with delivering on time and on budget, and there is little opportunity to consider balancing a reduction of operational costs with an increase in capital expenditure. Indeed, the usual practice is to “value-engineer” capital expenditure out, with little consideration for the potential knock-on effect for operational cost.

We often set targets in terms of external accreditation, for example, BREEAM Excellent rating. However, these external targets do not necessarily coincide with our internal priorities. Moving forward we will examine the entire lifecycle costs of buildings, including projections for different future energy/carbon costs. We will establish a stronger link between bids for capital funding and bids to the University's annual budget setting process ('planning round') for recurrent operational costs.

The running costs of a new building are not routinely scrutinised as part of the planning round process. This will change; projected operational budgets for new buildings will be required to address running costs more comprehensively than at present, and will include for the first time a projected carbon



footprint. Project approval will include approval of this recurrent budget. To avoid a disconnect between the planning round and the capital projects process, project teams will be required to provide sufficient information on emerging building projects to inform planning round forecasts; project teams will in turn require fuller information on estimated running costs to complete the financial case for each building.

In general, we do not account for the carbon cost of construction projects, both in terms of energy expended on site or energy embodied in materials. There are a few exceptions to this - these will have to become the norm. This is an example of where we can make use of expertise within the University to strengthen our carbon performance.

**Pillar Two:**

**Uncapping funding for rigorous business cases**

Over the past seven years, the University's Energy and Carbon Reduction Project (ECRP) has been funded to make interventions in the running of buildings or to replace equipment with more efficient models. Examples include LED lighting, freezer replacement, a substantial re-engineering of the exhaust system in Chemistry, and, (for illustration) at the small-scale, procuring custom insulation jackets for large valves in plant rooms. The ECRP has been funded by a modest Chest<sup>2</sup> allocation and seeks to fund schemes which provide payback times generally of less than 10 years. The opportunities, particularly in scale, tend to be limited by this recurrent allocation. If the payback times are arrived at rigorously and if the return on investment is sufficient to fund debt, then there is no reason why this activity should be capped financially.

We will transform ECRP funding to be divided into:

1. Chest funding for project scoping, pre-evaluation and post-assessment.
2. An uncapped green capital fund which would be drawn down in the form of loans to fund approved projects.
3. Chest funding for non-project activities (i.e. pillars three to seven).

Savings arising from project interventions will be used to service loans. Savings in excess of debt servicing will be used for activities that did not generate a financial return or to provide incentives for participation in projects.

We will consider whether this programme should be wrapped in a governance structure that gives greater assurance about project viability and accountability on servicing of debt, but at the same time can take informed risks in translating research outputs into action. The possibility that this governance structure can be shared with some or all of the Colleges will be investigated.

In a framework where the ability to service debt is the benchmark, transaction costs, particularly for small interventions, can become key. It may be that the capabilities within the University to develop and deliver projects will need to be increased, for example (and simply for illustration) solar panel installation might become an in-house capability.

A Green Fund could be used to fund quite substantial projects, for example, extensive retrofit of a major site, or a solar farm on University land outside the city.

A protocol for funding approval will need to be designed for carbon reduction projects. This is in order to ensure rigour in business cases and in post-evaluation of interventions. This protocol must address externalities such as the removal of asbestos or improvement to monitoring. It will also be important to fit carbon reduction interventions in with maintenance and to understand when financially nonviable interventions might be at their lowest cost.

**ECRP in numbers**

**2011**

First year of the ECRP

**122**

Number of energy and carbon reduction initiatives delivered

**4,438 tCO<sub>2</sub>e**

Annual carbon savings from projects delivered to date

**£11.5M**

Total ECRP expenditure to date

**£20.3M**

Total lifetime energy cost savings from projects delivered to date

**7 years**

Average payback period of projects delivered to date

**57**

Number of buildings that have received improvements through the ECRP

<sup>2</sup> A "Chest allocation" is a recurrent funding allocation.

## Pillar Three:

### Better information

We will improve our data and the way we communicate this to our staff and students. This is particularly important in our scope 3 emissions and thus our procurement and business travel activities. Moving to carbon neutrality will necessarily involve carbon offsetting at some point in the future. It is vital that we have information to inform our offsetting deliberations.

As noted above, our understanding of our scope 3 emissions is poor. Further, while we understand our scope 2 emissions across the University, we are not very good at communicating the breakdown of these at a scale that is meaningful to departments or research groups. Some examples to improve this situation are given below.

An initiative to devolve energy expenditure to departments will require better metering of the estate, certainly at the level of individual buildings. This work is already underway. This information will be publicly accessible (and digestible).

We are in the process of considering the implementation of a new procurement system. While it is unlikely that provision of the embedded carbon content of goods will be a universal (or

even common) practice for some time, consideration should be made to incorporate such a feature into the system, and, where appropriate, to present this information to users. It is recognised that better information is necessary, not sufficient, to achieve rational procurement.

In future modifications to financial systems, expense claims forms will be designed to capture business travel (rather than relying on specific travel procurement) in a straightforward manner. Air travel information, including source/destination of each flight will be recorded. In Schools where research activity is not energy intensive, air travel may well dominate emissions. Moreover, it is difficult to see how we would ever gain net zero carbon without offsetting air travel. In order to understand the implications for offsetting, we must have far better air travel information.

Related to this is the information gathering and dissemination required to support the Transport Strategy, noting that the Transport Strategy is only concerned with travel within and around Cambridge, that is, travel to work and travel at work, rather than travel for work.

## Pillar Four:

### Providing options

We need to provide options for departments and individuals, particularly with respect to procurement<sup>3</sup>, staff commuting and business travel. Again, the devolution of energy budgets is an example, as would be a good procurement system.

With regard to business travel, we should not be trying to discourage individuals from attending conferences where such attendance is a benefit to knowledge dissemination or career development. However, we will be supporting those who commit to pursue strategies that avoid and/or reduce long-range travel and promote alternatives, particularly for early career researchers. An enabling action, which would have the immediate benefit of reducing travel between sites within Cambridge, will be a clear implementation strategy for videoconferencing across a range of qualities.

Providing options is just that. It is not about “punishing” current behaviour, rather it is about supporting and encouraging behaviours that lead to better carbon outcomes and elaborating co-benefits. Again air travel is an area where much can be done.



<sup>3</sup> We should recognise that we have a poor handle on our scope 3 emissions. Pillar 3 will improve this, but care must be taken to report reduction on a like-for-like basis: our headline number will go up.

## Pillar Five:

### Providing teaching and learning opportunities

There is a great deal of research carried out in the University which is directly relevant to environmental sustainability. There are also many courses in which environmental sustainability considerations are a key component; and the Living Laboratory for Sustainability supports use of the University estate as a test-bed/context for research and uses findings to improve environmental performance across the University. But these components of activity are not navigable by most students. We need to make it possible for all students to access teaching and project opportunities both inside and outside their formal teaching and learning programmes, including a tighter linking between the Living Laboratory and academic departments.

## The Living Lab

The aim of our Living Lab is to bring together students, academics and staff to test new ideas, apply research to practice, and develop new solutions for enhancing environmental sustainability within the University.

We want the Living Lab to play a key role in delivering the aims of this Strategy, for example by:

- Actively sourcing opportunities to learn from our relevant academic research and expertise to inform our approach to carbon reduction.
- Increasing opportunities for staff and students to access and use good quality data on the University's energy use and carbon emissions, for their research, teaching and learning purposes.
- Increasing opportunities for student engagement with environmental sustainability through their curricular and extra-curricular activities.
- Providing internships for our students, which enable them to draw on the evidence and expertise within the University to further improve the environmental sustainability performance of our operations.

➔ [www.environment.admin.cam.ac.uk/living-lab](http://www.environment.admin.cam.ac.uk/living-lab)

## Pillar Six:

### Promoting and assessing behavioural change



It is important to recognise that much behavioural change, particularly in an academic environment requires intent, opportunity and information. We cannot expect constructive behavioural change without providing information on options and the opportunity to select options. Thus, this pillar is connected to pillars three, four, and five above.

We do have events to raise awareness of, and to recognise contributions to the reduction<sup>4</sup> of, the Collegiate University's carbon footprint. These will be sustained. However, as we place more information and options before staff and students, it is also vital that we observe, at bulk level, the choices that are made in order that we may better understand behaviour, and thereby provide better options, better information and better teaching programmes.

Embedding carbon-awareness with University procedures is essential. We will place greater emphasis and scrutiny on carbon plans as part of the submission institutions and Schools make into the annual planning round process.

<sup>4</sup> Such contributions are often nationally recognised as well, for example: <https://www.environment.admin.cam.ac.uk/news/university-cambridge-picks-dual-green-gowns-awards-honour>



## Pillar Seven:

### The estate, transport and the region

The long-term plan for the University estate must consider our carbon footprint. This will necessarily include travel to work and thus must take into account where staff live, how our estate is developed and policies to influence the development of the Cambridge region.

The University's Transport Strategy, a companion document to this, sets out commitments in relation to the following key areas:

- Car parking
- Walking
- Cycling
- Public transport
- Transport electrification
- Relationship with spatial planning and working practices
- Data, information and communications
- Partnership

Each of these will have an impact on our carbon footprint.

We will also be developing a strategy for spatial planning, which will look at the future shape of the University estate and wider region.





## Theme One: Analysis, reflection and dissemination

For each of the activities that is undertaken in the implementation of this Strategy, we will actively monitor their impact, and use this information to refine our approach; to understand where our peers are doing better; and to provide the groundwork for sharing success. Consideration must include an examination of unintended consequences that can arise when a strategy is driven by a single metric. This analysis will be the responsibility of the University's Environmental Sustainability Strategy Committee.

In a rigorous academic environment, collaboration with colleagues will be facilitated by the availability of good evidence; we should view our experiences in reducing our carbon footprint as potential subject matter for teaching and research.



## Theme Two: Partnership

Our collaborations must go wider than the Collegiate University. Collaboration will be inherent in the Transport Strategy where we need to co-ordinate our activities with regional governments and organisations, but these collaborations should go beyond transport to encompass for example, renewable generation and energy storage. We should also be engaging with our supply chain, and with organisations that are ahead of us in the management of their carbon footprints.

## Find out more and get the latest updates

Keep up to date with all our activity along with relevant news from across the University with our monthly newsletter: [www.environment.admin.cam.ac.uk/greenlines](http://www.environment.admin.cam.ac.uk/greenlines)

## Social bookmarks

 [@CambridgeSust](https://twitter.com/CambridgeSust)

 [facebook.com/CUenvironment](https://facebook.com/CUenvironment)

 [environment.admin.cam.ac.uk](mailto:environment.admin.cam.ac.uk)

This report was published in March 2020.

The University of Cambridge endeavours to ensure that the content and information available in this report is accurate at the time of publication.